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# The Four Knowledges of Transport Planning: enacting a more communicative, trans-disciplinary policy and decision-making

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**Abstract**

There is widespread criticism of much transport planning practice for relying on particular, 'technical', knowledge forms characterized by instrumental, means-end rationality. At the same time politicians are criticized for taking 'political' decisions with not enough regard for the outcomes of such technical work. Increasingly attempts to capture the embodied knowledge and values of citizens are also brought into this contested terrain. But which knowledge forms should be significant in making policy and taking decisions; and how might they be brought together in political decision-making which is itself subject to its own rationality? This paper argues that the variety of knowledge forms in everyday transport planning processes should be more transparently articulated. Subsequent reflexion can help enhance the quality of transport planning processes, while such transparency bolsters the democratic legitimacy of the outputs of such processes. Such a more explicitly communicative*, trans-disciplinary* mode of governance would help to challenge the power of political rationality. This conclusion has implications for how transport planning as a discipline is enacted.

**Key words**

Transport planning; deliberation, knowledge forms; process design; epistemology, trans-disciplinarity.

## 1. Introduction: the realities of transport planning[1]

Effective transport systems are an essential component of a sustainable, just and economically competitive territory. However what constitutes an effective system will always be contested and how one arrives at decisions and policies to bring such systems into being equally so. The discipline of transport planning has evolved to address this challenge through a number of ever more sophisticated methods. Arguably much effort in particular has focused on ex-ante appraisal methods to evaluate the possible outcomes and effects of schemes and strategies (Mackie and Worsley 2013). But how strategy-making is actually conducted in practise, and the work that the techniques and practices of transport planning play therein, is under-researched (Gudmundsson 2011). Where studies exist they suggest that decisions, policies and strategies[2] are often determined by hunch, ideology and the push-and-pull of political force as much as 'technical' evidence (Flyvbjerg 1998, Gudmundsson 2011, Hrelja et al 2013, RAC Foundation 2015). Into this complex arena comes greater demand for public input into policy and decision-making both from government itself and sometimes citizens. At the very least the latter manifests itself as a demand for greater transparency regarding how policy and decisions are arrived at.

This paper explores this terrain to suggest that the transport planning discipline needs to more *explicitly* address the ways that different forms of knowledge coexist and are brought together in planning processes which can be characterized as relational and communicative. Relational in that the outputs of transport policy and decision-making are strongly influenced by the relations between the principal actors in a given field; and communicative in that the rationality underpinning action is and

[1] The paper draws primarily on the UK, and particularly the English, experience of transport planning, but the broad argument applies to many jurisdictions

[2] For the rest of the paper, 'transport planning' is used as a generic term for policy and strategy-making with regard to transport but not micro-level operational planning where it is argued, after Naess and Strand 2012, micro-simulations can play a dominant role.

should be determined by communications between them. A critical issue in this for democratically legitimate transport planning lies in who the actors are who contribute the 'knowledge' that determines policy direction.

Such a project allows for greater transparency with regard to the advice given to and used by politicians, and thus potentially greater trust in the outcomes. This argument is developed by first outlining the trajectory of transport planning practice, suggesting that practices therein have not adjusted to changes in either the wider governance landscape or to demands from those who seek more socially just and/ or ecologically sustainable mobility futures (e.g. Banister 2008). The paper then explores how transport planning processes might develop to generate more robust policy and decision-making and what challenges need to be addressed.

## 2. Critiquing technical-rational transport planning

The second half of the twentieth century saw an increasing sophistication in the methods and techniques associated with transport planning. Increased computer modelling capability, better information technology and improved educational standards all drove up the quality of inputs to planning processes. But, the methods and techniques were increasingly called in to question in terms of how well they were able to predict long-term futures and help inform policy-making processes (see Timms 2008; and Naess and Strand 2012 for lively critiques). Many were associated with practices of 'predict and provide' whereby travel demands were predicted using ever more sophisticated models which were then provided for through increased supply (Owens 1995). Where mature transport networks existed, 'predict and provide' as an idea was increasingly questioned. Significantly it took no account of the aims of other policy sectors, this at a time when policy integration was increasingly becoming recognised as an important governmental challenge (Te Brommelstreot and Bertolini 2010).

As such, transport policy based on predict and provide was heavily path-dependent and increasingly disconnected from wider policy goals. Thus the 'predict and provide' approach was judged increasingly deficient *in its own terms*: by taking little account of the outcomes of planning decisions; as research showed that increases in supply released latent demand (e.g. SACTRA 1994; Downs 2004); and, it led to unjust and unsustainable outcomes (Naess and Strand 2012; Banister 2008). Thus Phil Goodwin concluded that years of refining demand models led to the, "*inheritance of an analytical toolkit that is bright, impressive, of unchallengeable intellectual achievement, and wrong*" (1997: 9).

Ideas of the 'new realism' (Goodwin et al 1991), of 'predict and prevent' (Owens 1995); and latterly the sustainable mobility paradigm (Banister 2008) all sought to address some of these questions. But calls for greater attention to social justice and a wider politics of mobility often remained outside of this system which focused on a narrow economic competitiveness rationality and neo-classical techniques. Ideas of the smart city, big data and 'green' technological innovations focused on individual behaviors outside of wider determining social practices also have a strong potential to further cement existing social and ecological inequalities and injustices (Banister et al 2011; Shove et al 2012; Boussauw and Vanoutrive, 2017). Regardless of the societal challenges transport planning claims to address, Naess and Strand (2012) conclude that existing practices are incapable of guiding choices about whether to build particular infrastructures, or indeed to guide strategy, due to the fundamentally open nature of the system under scrutiny.

Further critiques of the technical-rational approach to policy-making come from both outside the transport planning discipline and within it. Ideas of rationality in policy-making were much criticized in the 1970s and 80s. Linear models whereby evidence

would be turned into policy were countered both by political theory and by real-world evidence from inside local and central governments. Studies noted that policy was and should be a social construct in that what constitutes a ‘problem’, and the means used to address this problem, were a matter of political judgement. How policy was determined was explained through a number of models of: garbage cans (Cohen et al 1972); policy discourses (Hajer 1995); advocacy coalitions (Sabatier and Jenkins Smith 1993); policy streams (Kingdom 1984); and social learning (Hall 1993). All were characterized by an emphasis on social relations, that for politicians and transport planners, "ways of seeing and knowing the world, and ways of acting in it, are...constituted in social relations with others", (Healey 1997: 55-56). And this seeing the world was mutually constitutive of the discourses that underpinned a policy field, such as ‘predict and provide’, which then framed a given reality (Rein and Schon 1993, Hajer 1995) wherein facts, values, theories and interests were brought together by actors with limited degrees of critical reflection (Vigar 2002). The next section addresses these concerns by introducing the idea of future transport planning as a communicative trans-disciplinary challenge.

## 3. Transport Planning as a communicative trans-disciplinary challenge

A debate informed by the above findings as to how policy-making actually occurs in practice accepts that models and apparently neutral techniques have embedded within them all sort of value judgements. Opening up the ‘black boxes’ of the models and debating such assumptions is one way of getting agreement about the parameters of the debate and the robustness of the models. Such a debate could then be situated alongside a whole range of other, ‘situated’ knowledge, such as the lived experience of a place or network and the emotional and affective dimensions being (im)mobile. Thus more communicative, open, learning-oriented approaches would include an opening up of specific tools for debate but also facilitate a more general sense of stakeholder involvement in the design of policy processes as well

as policy development, choice and implementation (Willison 2001; Willison et al 2003; Vigar 2006; Timms 2008; Curtis and Scheurer 2010; Murray 2011; Hrelja et a; 2013).

Acknowledgment of the complexity of the issues and their management[3], would however help to highlight some of the social and environmental elements that are poorly accounted for in much transport planning practice (e.g. Bullard et al 2004; Preston and Rajé 2007; Pucher et al. 2007). It would also require transport planners to move away from an impossible position of neutrality, toward an objective position that acknowledges one's own values and who and what might benefit and not benefit from planning attention.

For example, Castells (1996) conceptualizes environmental problems such as those arising from transport externalities, as ones of struggles over space and time. This arises most significantly in transport terms between spaces of flows and spaces of places; or between 'enclaves' and armatures' (Shane 2005); or fundamentally the challenges and opportunities of movement and settlement (Mumford 1966). Castells sees this as a battle between consideration of the network society's dominant capitalist processes (flows) and people's lived routines (spaces). This leads to conflicts over specific projects as well as transport flows generally as they expose debates between "*abstract priorities of technical or economic interests over actual experiences of actual uses by actual people*" (1996: 124). Much transport planning practice focuses on flows with little attention to capturing and valuing place-based issues and experiences, but it is the latter that come into sharp focus when transport schemes are revealed to the public. We need then to capture experiential knowledge and valuations of place and find a way of integrating them with the dominant forms of

[3] 'Management' is used here in contrast to the idea of 'solutions', to congestion etc. One does not meet the mobility demands of a city and its myriad entities in ways that do not have negative consequences. Thus, recognition that we are attempting to manage situations to achieve certain objectives would help in this regard. Sustainability for example is a process and not an end-state.

knowledge typically extant in transport planning processes. This in turn requires a large-scale abandonment of instrumental rationality at the level of agenda-setting in particular, toward a more open and communicative way of determining strategy and making decisions. This in turn suggests greater attention to the design of policy-making processes. Critical to such efforts is attention to, and potentially advocacy of, the voiceless in policy debates – often the old and the young; species and habitats - if sustainable mobility is to be a reality.

The contentious nature of much transport planning in an era of greater citizen activism and less trust in experts also suggest that planning is unlikely to succeed if conducted in a top-down, autocratic way. So, active engagement in policy development is necessary if policies are not to be rejected. Greater involvement will also improve the flow of information, of situated knowledge, to a strategy. And one way of overcoming implementation deficits is by giving people ownership of strategies through participation. At present comparatively little attention is paid to this in transport planning with rather more devoted to adjusting demand models for example. The principal challenge for transport professionals is to figure out how to engage such communities in the practice of policy development. That is how to create the fora for discussion and the channels of communication throughout the strategy development process; and within this to consider how far such consensus building efforts might lock in existing path dependencies or break them open (Hrelja et al 2013).

Communicative approaches[4] are ways of governing that focus "*on the exchange of arguments in an atmosphere of equality*" (Hajer 2009: 174). Such approaches fit with the prevailing orthodoxy of network governance wherein trust and authority vested in

[4] While there are differences, particularly in the origins of the theories, communicative approaches are similar to those often labelled deliberative and collaborative.

traditional governmental institutions is relatively low but where it remains possible to act through consideration of how such governance practices are 'democratically anchored' (Torfing et al 2009). Planning with a wider set of stakeholders provides a way of potentially integrating different ideas and more diverse knowledge sets, often with incommensurate epistemological origins.

Such approaches also recognise the failure of solely modernist practices, such as those detailed above. Two avenues are of interest here. First, there is increasing recognition in academic circles that disciplinary boundaries often perpetuate approaches not suited to contemporary, complex problems. Inter-disciplinary work is thus often proposed to bring together experts from different disciplines to provide new perspectives. It reflects the idea that innovation frequently arises from interactions outside the immediate policy community. Second, there is increasing attention to involving 'non-experts' in such practices, often bringing so called 'lay' or 'situated' knowledge, to generate information and 'co-produce' solutions. These two elements can be brought together in a 'trans-disciplinary' approach which encompasses experts from across disciplines but also non-experts (e.g. Hirsch Hadorn et al 2008). The key element in performing trans-disciplinary transport planning is the consideration that a number of different forms of knowledge can offer useful perspectives when we confront a complex problem (Thompson Klein et al 2001). Various authors have set out ways of expressing and categorizing these (e.g. Healey 2007; Raymond et al 2010), and the next section explicates four broad knowledge blocks.

## 4. Knowledge forms for communicative transport planning

This section outlines four areas of knowledge that are in play for those in charge of a transport planning process. The four are closely interlinked and presented here as a

useful heuristic that allows practitioners and researchers to reflect on the knowledges that are and are not in play in any given process.

***Embodied/ local knowledge***

In devising a transport strategy for a city or neighborhood we need to know how people travel, how they might travel if they were able or if the service offer were different, what is missing from their daily lives that might have an accessibility component etc. We might also need to know what the particular environmental and cultural challenges for this place are- what habitats, buildings and open spaces need preserving? What cultural issues do we need to know- are cars a status symbol, is cycling among this community stigmatized or fashionable? Are people angry about road danger, pollution, and the dominance of traffic? Again some of this is technical work but there is a great deal of peopled input to this, which is impossible to know from afar. In short it encompasses what people value as well as what hey 'know'. To get a good sense of it requires talking, and crucially listening, with particular groups. Authors such as Talvitie (2009) place a great deal of emphasis on an initial and long listening phase at the outset of any transport planning intervention.

We should also be aware that getting to all the sections of the community we want to address will take resources and a degree of targeting to avoid policy being shaped by the 'usual suspects'. Crucially this work needs to be done at agenda-setting or problem definition stage, to ensure that the issues that matter are present in the discussions as they then proceed and to not harden participants positions against a process which potentially does not appear to include their concerns.

In such considerations we should think about who or what do we want to benefit most from our policies and what interventions work best for them. This is significant due to recognized deficiencies in approaches centered on Habermasian communicative

rationality (Tewdwr Jones and Allmendinger 1998) and in particular in response to the criticisms that communicative processes can be taken over by the already powerful (Bickerstaff and Walker 2005; Fung and Olin Wright 2003). For them to be more than tokenistic requires commitments to them by the transport planners and politicians in charge. It may require advocacy on the part of transport planners to promote the views of those unable or unwilling to participate in planning processes. This in turn requires an acknowledgment that the resources deployed in transport planning represent political judgment rarely noted by practitioners and politicians. It also raises issues that are not readily resolved concerning the meshing of such procedures with traditional channels of representative democracy (see Torfing et al 2009).

Much of the information revealed through such processes may not be immediately apparent and often is not explicitly held by informants until questions are asked and people are engaged in dialogue, often requiring the use of radical techniques such as 'probes' (Gaver et al 1999; Raymond et al 2010). But eliciting responses from 'citizen experts' who bring their 'lay', 'local' or 'situated' experience is vital for effective future strategy. Experience or perception is not necessarily knowledge (Rydin 2007), but such claims to knowledge can then be tested, through dialogue in the first instance. Such experiences may also not be carried in a structured, easily articulated way and so care is needed to elicit and capture it. This information gathering needs to start early on in a process before agendas are set and strategy development processes fixed. Such processes are difficult to enact, which again places a demand on practitioners to go beyond their comfort zone, and is in itself an issue that needs to be acknowledged in process design (Tewdwr Jones and Allmendinger 1998).

Making policy in this way also facilitates learning among participants and can often lead to 'better' outcomes as a consequence (Fischer 2003; Hajer and Wagenaar

2005, Hajer 2009). This will require attention to critics who can contribute important information (Hajer and Versteeg 2011). The inclusion of many groups who often remain voiceless in transport debates is also vital. While a literature on social inclusion and transport advocates greater equity in transport planning, there is evidence of the systematic exclusion of groups from policy-making and in turn it is not surprising when transport planning practice and policy favours the already hyper-mobile. Attention to this requires financial and other resource but examples exist (Bickerstaff and Walker 2005; Niches 2010).

In summary therefore, participation from 'non-experts' is to be encouraged for a number of reasons including (after Vigar 2006):

- democratic purposes;
- uncovering, sharing and providing knowledge of others' values, experience and local conditions, 'lay', 'local' or 'situated knowledge';
- debating these various 'knowledges', developing awareness of associated policy complexity and facilitating learning associated with the problem at hand
- generating shared ownership of strategies and programmes, thus potentially reducing implementation deficits.

The integration of such expertise is required throughout the process: defining the problem through statements of need; commenting on proposed solutions; giving feedback on scenarios; and evaluating as the plan proceeds. All of this activity requires resource but it is argued that such resource is minimal in the context of the monies spent on projects within a transport strategy and that policies increasingly need to be constructed in such a way to engender trust in the system from citizens.

***Technical /codified Knowledge***

Other knowledge and analysis is almost inevitably needed to be able to generate purposeful transport strategy. Much of this will be 'expert' knowledge carried in house among a transport team: for example broad trends in car ownership, energy prices, technological change all have to be considered. Transport planners will have a good existing knowledge of networks, of capacity and other problems therein. Established models and techniques can also be useful in this. But as the above discussion illustrates, a process based only on these factors is limited and likely to fail, not least because of future uncertainty which renders many models obsolete (for a more theoretical account of why see Bertolini 2007).

Greater information is needed about urban-regional dynamics to complement the transport-oriented work. This information is likely to lie outside the discipline of transport planning: by urban planners; by university geographers and economists; by futurists and think tanks. Such useful information might concern changes to employment structures and locational demands of business, demographic changes etc. For example, what is the likely future of a city's industrial base likely to be – is local industry under pressure from exports, can transport play a role in helping? Is a city likely to be a location for growing industries in the future and what transport provision would encourage such industry? We might need to be aware of changes in the age profiles of a city and what the implications of an ageing society might be for transport demands and for social justice. Again, the challenge is in integrating that knowledge in to the participative arenas to support and challenge the views therein.

***Practice –centred: Knowledge about what works***

Transport planning benefits from an awareness of what works in addressing particular policy objectives. Such awareness can be discussed with stakeholders as a way of integrating knowledge forms.

A key element in this is learning from past experience both locally and elsewhere. The power of knowledge of other cases derived from experiencing them is well understood and lies behind the processions of experts and politicians travelling to good practice examples. These are everywhere these days and there exists a growing literature in the transport field (e.g. *Transport Policy* 11(2) special issue, Stead et al 2010). Good practice is undoubtedly helpful but it can also be a dangerous tyranny as ideas circulate rapidly round the globe, often by consultants, with little awareness of the context in which policies were successful or that where the policy is destined (Healey and Upton 2010). For example, Bogota's 'best practice' experience of bus rapid transport is not just a single technology. It is also a 'bundle' of ideas, of specific techniques, of administrative and legal arrangements, of life and work cultures (Healey and Upton 2010). A policy might have succeeded somewhere because of what was tried before and other particularities of context- 'our place is so bad we need something radical' etc. In learning from best practice we need to know the 'infinite depth' of context and probe in to the 'bundle'. Problems occur when local adaptors of best practice are insufficiently aware of the context from which best practices originate and the small, often hidden things and the combinations of them, that mean a policy works there (but may not work here). The lesson is that places, and thus context, are different. We should learn from, rather than transfer; adapt but not seek to emulate, the experiences of others (Dolowitz and Marsh 2000).

The opposite extreme to slavish emulation is the problem of 'terminal uniqueness' or exceptionalism. The idea of terminal uniqueness originates in psychiatry and denotes someone who remains in denial of the need to change because they feel that no one else has their set of problems and circumstances and so no one else can offer solutions. Governments, city mayors, and transport planners can all fall prey to this when talking about their city. Thus, 'resistance' to ideas can also occur. Thus we need to be reflective about the dangers of falling prey to exceptionalism, while

retaining a healthy analytical cynicism about what might work in another place. A critical job for transport professionals is thus to deploy judgement to consider the power of exemplars, their potential transferability and to set out this knowledge with the lay and technical knowledges described above. Exemplars can be very helpful in doing the political work necessary to overcome skepticism both within an institution and beyond. But, good practice is there to inspire rather than to be copied.

***Political Knowledge***

As noted at the start of is paper, much transport planning is heavily dependent on 'political' decision-making with little regard to technical evidence. The distance between real-world planning and evidence showed that processes were variously based on technical 'evidence' and were also not often constructed in a 'linear'.way from problem to solution. Authors such as Kingdon (1984) suggested that policy was best explained as the collision of possible policy, problem and political 'streams' all flowing through a murky primeval soup in which ideas float around and combine. When the three streams come together "windows of opportunity" are opened, usually because of a compelling problem, or because of something arising in the political stream which creates a political window. At such times the policy stream can then push a solution and couple it with the problem. Transport planners much be alive to such possibilities but also accept that the political context can change, and so timing is vital, but also that they too can shape the context in which they operate in the longer term. In integrating knowledge forms and prioritizing some knowledge over others transport planners will inevitably be conscious of the wider political context in which they are situated. That is any process needs to acknowledge, as Forester (1989) notes, that their every move takes place on "an institutional stage". This assertion explains the frustration felt by many regarding the gap between transport policy and the research base.

Such ideas were best illustrated in Flyvbjerg's groundbreaking longitudinal study of transport planning in Aalborg. His conclusion that technical-rational knowledge could be significant, but only when powerful political coalitions mobilised it, was framed by the idea that rationality is context-dependent and that the crucial contextual element is decision-makers' power. He thus concludes that, "power has a rationality that rationality does not know, whereas rationality does not have a power that power does not know" (Flyvbjerg 1998: 2). What Flyvbjerg (1998) defines as *realrationalität* is contingent and limited by the political realities transport planners find themselves in.

However, change is possible and it results from accounts that challenge the inconsistencies present in the governing coalition's discourse. Such challenge may have to be sustained over a long period, mobilizing a range of technical, lay and practice-centred knowledge. But Flyvbjerg also contends that reason and rationality, or the force of the better argument, is much more likely where there is stability in governing relations (1998: 194; see also Vigar et al 2014).

***Integrating knowledge forms***

What then do we do with all this (different) knowledge? How do transport planners make sense of it, and determine which elements might prevail? Debates on the synthesis of knowledge are enacted in various policy areas (e.g. Corburn 2005). Most authors suggest that there is no single way of doing so (see Raymond et al 2010). Rather the point is the need to recognise an epistemology of multiple forms of knowledge, including the broad political context within which such work is enacted (Sandercock 2003). Within this**,** synthesising such different knowledge becomes a task of judgement built up through experience and collaborative effort; this is the *craft-work* of being a professional (Amin and Roberts 2008). Indeed, Flyvbjerg (2001) has argued, after Aristotle, of the primary significance within planning processes of

*phronesis*, the art of judgment that is superior to technical rationality and value-rationality in that it seeks to understand and integrate both.

As such, attention to the principals of knowledge integration and to the *processes* by which integration might be performed is the best way forward (Raymond et al 2010). Thus policy-makers should be transparent about why some forms of knowledge are rejected and others privileged. Within such processes lay experience can be helpful in challenging and sometimes over-turning conventional 'scientific' wisdom and similarly transport planners may need to gather data to challenge lay experience. Such an open process also provides scrutiny to technical knowledge with in-built problems of bias that are symptomatic of a community of practice (Flyvbjerg 2009).

While the precise definition of knowledge synthesis is context dependent and so difficult to generalise, techniques like scenario building may be helpful in that they build pictures by synthesising the data in an attempt to define the future not respond to one in a self-fulfilling way (e.g. Curtis and Schreurs 2010, Lyons and Davidson 2016). But the critical point is that if communicative processes are designed well from the start then many of the criticisms of the ways knowledges are processed can be bypassed. The commissioning and transparent sharing of 'data' among lay and expert groups *throughout* the planning process is important for this to be achieved. This is in stark contrast to the 'decide-announce-defend' approach which is still all too prevalent in transport planning practice and which entrenches participants in quickly established positions. Thus the strategy-making process becomes one of testing various claims to knowledge and actively generating new, sometimes 'synthetic' knowledge achieved through such testing and debating. The creation of arenas for debate, which should reach out to likely critics to shape and test the evidence, is an important part of strategy-making in that done well such creation can build trust and social capital and generate a better strategy through the work performed in them.

And beyond this the knowledge garnered through the process can help build social capital and learning. Knowledge is then synthesised and how we think about an issue may need to be reconsidered or reframed. And while political rationality heavily frames what is immediately possible, change is also practicable and indeed likely in the longer term.

## 5. Prospects for Communicative transport strategy-making

The ideas described above point to communicative, deliberative, collaborative, or participatory approaches to strategy-making. A growing literature in this field recognizes the problems inherent in such an approach- of its resource intensity; of the skills and attitudes needed to participate in and manage it; of certain voices crowding out others; of the difficulties where participatory experience is limited; of the need for trust to engage in such 'transactive' work (Friedmann 1993); and of the difficulties of moving practitioner mindsets from a techno-rational mode of working that may struggle to recognize and incorporate politics, values, experience, emotion and affect into strategy. But as a set of broad principles, as a direction of travel, it has utility and this has been recognized in the transport field (Willson 2001; Willson et al 2003; Vigar 2006; Marshall, 2016). There are particularities associated with transport planning as a target for such an approach however (see also Sager and Ravlum 2005).

First, citizens are to varying extents all mobile and thus have knowledge of their mobilities and immobilities that can be articulated and, unlike some areas of government, they may have strong opinions to voice. But capturing the huge variety of this experience – across different ages, gender, ethnicity, lifestage etc, is very difficult and the balance between securing legitimacy through capturing a good sample of such experience and the economy of effort necessary within a policy process is inevitably a balancing act and a significant practice challenge (Dryzek

2001). Citizens may also struggle to recognize that long-term change in travel behaivour is possible and addressing this again emphasizes the requirement for skilled facilitation.

Second, this stakeholder complexity is further complicated as transport projects and policies are inherently multi-scalar in nature. The distribution of their impacts within and across scales makes consideration of their costs and benefits complex and potentially riven with conflict, for example, people may want to benefit from new infrastructure but will not want to be so close to it that they suffer from its negative externalities such as pollution. In addition, contemporary challenges of sustainable development are rarely tackled through an aggregation of local considerations (Owens and Cowell 2010). Local jurisdictions may also disagree over priorities in a region and the 'best' solution may not emerge from a debate among political coalitions. Such complexity thus makes consensus difficult but also, given the frequent crossing of political boundaries justifies intervention at multiple scales i.e. sometimes an honest broker at a higher scale can be helpful in moving a debate forward and if necessary making a judgment in a wider public interest.

Third, many 'myths' perpetuate the transport field (Black 2001) and these are hard to unpack and require both technical and communicative skills not always present within the institutions charged with transport planning. They require the construction of arenas in which such evidence can be put and questioned, which can constitute a difficult obstacle, and may involve a complex web of mass and social media, and techniques such as citizen juries, the operation of all of which also demands certain skills and experience.

Fourth, the transport planner must recognize their role as more than a ringmaster of a debate, they must intervene to co-commission robust evidence and voice their

expertise of both the technical and the political, and become a 'skilled voice in the flow' (Throgmorton 2000, see also Forester 1991). When to do this is a critical issue as outlined above. The use of GIS technology in demonstrating outcomes when coupled with scenario-building for example provides one way of bringing together technical data with communicative process (Curtis and Scheurer 2010) and participatory multi-criteria analysis situated within a broader deliberative process offers another.

Finally, transport professionals tend not to be educated in process management and associated facilitatory skills.[5] Collaborative processes require the development of particular skills, notable among them being listening, talking, narrating and interpreting; the awareness of the application of knowledge in action; and knowledge of the institutional context and the importance of issues such as timing in such contexts (Forester 1991; Frantzich 1999). But the best transport planners often instinctively have these capacities (Forester 1991). The first step is a recognition of the range of knowledge potentially in play and the need to pay close attention to the design of planning processes. Extrapolating from this, the skills of professions as a whole may be an issue for educators and professional bodies.

## 6. Conclusions

Transport plans often fail and to some degree this is to be accepted as all strategic interventions of this type will be complex with myriad elements (Jessop 2003). Indeed the idea of policy and decision making as experimental needs to be promoted more widely (Talvitie 2009). But transport plans and schemes often promise much and do not deliver due to a failure to attend to the practices of their making.

[5] This is certainly not inevitable. For example, in Western Australia significant numbers of transport planning staff at the Department for Planning and Infrastructure were trained in how to initiate more communicative transport planning in the mid-2000s.

Addressing this failure requires the dominant approach to transport policy and decision to change to more explicitly and transparenly acknowledge the different forms of knowledge and different ways of integrating it into transport planning processes that both are and might be in play. Weaving together knowledge of local conditions, including local political opportunities and constraints, broad urban-regional dynamics and awareness of what works is a great skill which requires judgement accumulated over time (Forester 1991; Healey 2010). Such situated judgement is what marks out professional work and an associated area of practice (Amin and Roberts 2008).

It also requires a transport planner to be a 'post-empiricist expert' "operating between the available analytic frameworks…, particular policy findings, and the differing perspectives of the public actors"' (Fischer 2009: 11). Doing so requires reflecting on the commissioning, accumulation and communication of a wide range of knowledge, while addressing silences in policy debates; and potentially acting as an advocate for such silences against powerful coalitions, all with one eye on the political knowledge and the political opportunity structure in the given context. This suggests that transport planners be more explicit in their own normative positions and the implicit values and assumptions present in the knowledge they first look to and rely on. It suggests that such an expert become less a well-informed operator of the machinery of techniques and models and more a skilled synthesiser of various knowledges and be a good communicator with 'craft' experience (Amin and Roberts 2008; Healey 2010; Wenger 1998). It suggests a move away from the decide-announce-defend approach that is so typical in the discipline and toward what Bishop (2015) terms 'engage-deliberate-decide'. It also implies reform of the education associated with transport planners in many contexts. Reforming the ways transport strategy is typically made is however an essential requirement if transport strategies and transport planners are to assert the value of transport planning informed by a variety

of knowledges that can address both transport planning and wider societal challenges.

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